

## Section 414

### 412-3 UTILIZATION OF EXCAVATED MATERIAL

Use and place suitable excavated material in accordance with Articles 410-7 and 410-8.

Notify the Engineer a sufficient time before beginning the excavation so measurements may be taken of the undisturbed ground.

### 412-4 MEASUREMENT AND PAYMENT

The price and payment below will be full compensation for all items required to complete unclassified structure excavation including, but not limited to, those items contained in Article 412-1.

*Unclassified Structure Excavation at Station \_\_\_\_* will be paid at the contract lump sum price.

Payment will be made under:

Pay Item	Pay Unit
Unclassified Structure Excavation at Station ____	Lump Sum

## SECTION 414

### BOX CULVERT EXCAVATION

#### 414-1 DESCRIPTION

Excavate all material necessary for the construction of box culverts with floor slabs in accordance with the contract or as directed. Excavate, blast, drain and divert water, bail, pump, brace, shore, provide sheeting, cribbing, cofferdams, culvert foundation conditioning, subsurface drainage and drawings; backfill, haul and dispose of materials.

Do not deposit excavated materials, nor construct earth dikes or other temporary earth structures in rivers, streams or impoundment or so near to such waters that they are carried into any river, stream or impoundment by stream flow or surface runoff. As an exception to the above, obtain written approval for the use of confined earth materials in cofferdams for structure foundations.

#### 414-2 MATERIALS

Refer to Division 10.

Item	Section
Foundation Conditioning Material	1016
Stone, No. 78M	1005
Subdrain Fine Aggregate	1044-1

#### 414-3 FOUNDATION EXCAVATION

Notify the Engineer a sufficient time before beginning the excavation so measurements may be taken of the undisturbed ground. Do not disturb the existing ground at the culvert site without permission.

Where necessary for safety, slope, shore, brace or protect by cofferdams the foundation openings in accordance with State and local safety standards. Perform foundation excavation and related work in such sequence that no portion of the culvert will be endangered by subsequent operations. Protect completed portions of a culvert from blasting.

Remove and dispose of boulders, vegetative matter and any other objectionable material.

Notify the Engineer after excavating each foundation. Do not place any concrete until obtaining approval of the excavation depth, the character of the foundation material and permission to proceed.

Take special care not to disturb the bottom of the excavation until immediately before placing reinforcing steel and concrete.

**414-4    CONDITIONING CULVERT FOUNDATION**

Excavate to a depth as directed below the bottom of the barrel or wing footing and replace the excavated material with foundation conditioning material.

When the foundation material beneath a portion of the barrel or wing footing is rock or incompressible material and softer material is beneath the remainder of the barrel or wing footing, excavate the rock material within the neat lines of the barrel or footing to a depth of 12" below the bottom of the barrel and footings and backfill with foundation conditioning material.

Use Class VI select material foundation conditioning material in accordance with Section 1016.

**414-5    PUMPING**

Pump from the interior of any foundation enclosure to preclude the possibility of the movement of water over or through any fresh concrete. Do not pump while placing concrete or for at least 24 hours thereafter, unless done from a suitable sump separated from the concrete work by a substantially watertight wall.

**414-6    UTILIZATION OF EXCAVATED MATERIAL**

Use suitable excavated material in accordance with Article 410-7.

**414-7    BACKFILLING AND FILLING**

As soon as practical after completing the box culvert, place the backfill and redirect the stream through the culvert.

Use approved material for backfill that is free from large or frozen lumps, wood or other undesirable material. Where there is not an adequate quantity of suitable backfill material available from culvert excavation, provide suitable backfill material compensated in accordance with Subarticle 410-10(C).

Eliminate any excavated slope adjacent to backfill areas by stepping or serrating to prevent wedge action.

Place and compact all portions of the backfill that become a part of roadway typical sections or their foundations in accordance with Subarticles 235-3(B) and 235-3(C). Place all other portions of the backfill in layers not more than 10" in depth of loose measure and compact to a density comparable to the adjacent undisturbed material. Refill all excavated spaces not filled with permanent work with earth up to the ground surface existing before the excavation.

Do not place backfill or embankment behind the walls of culverts until after placing the top slab and allowing development of the minimum compressive strength required by Article 420-20.

Place backfill or embankment material simultaneously insofar as possible to approximately the same elevation on both sides of the culvert and do not carry it to an elevation higher than one foot above the top of footing or bottom slab until the concrete develops the minimum required strength for the class of concrete used as specified in Table 1000-1.

**414-8    SUBSURFACE DRAINAGE AT WEEP HOLES**

Place a stone drain consisting of one cubic foot of No. 78M stone contained in a bag of porous fabric at each weep hole. Place subdrain fine aggregate beneath, around and over the stone drain, so the stone drain is covered by a layer of subdrain fine aggregate at least one foot thick. Connect all drains with a horizontal drain of subdrain fine aggregate at least one foot square in cross section. In the case of abutments and retaining walls, in addition to the above requirements, place a vertical drain of subdrain fine aggregate at least one foot square in cross section at each weep hole to an elevation 2 ft below the subgrade or surface of the embankment.

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When embankment placement around the structure is part of another contract, the portion of the subsurface drainage system described above, which is located in such embankment, is not part of the work of this section.

### 414-9 MEASUREMENT AND PAYMENT

The prices and payments below will be full compensation for all items required to complete box culvert excavation including, but not limited to, those items in Article 414-1.

*Foundation Conditioning Material, Box Culvert* will be measured and paid in tons of material that is placed within the established limits. The number of tons of material is determined by weighing the material in trucks in accordance with Article 106-7. No deduction will be made for any moisture contained in the material at the time of weighing. Such price and payment will be full compensation for all excavation made below the bottom of the barrel and wing footings in addition to furnishing, hauling and placing the foundation conditioning material.

*Culvert Excavation, Sta. \_\_\_\_* will be paid at the contract lump sum price. No measurement for payment will be made for this pay item, and no adjustment in the contract lump sum price will be made unless the size, length, elevation or location of the culvert is revised. If the size, length, elevation or location of the culvert is revised, such revision will be an alteration of plans or details of construction in accordance with Article 104-3.

Where it is necessary to provide backfill material from sources other than excavated areas or borrow sources used in connection with other work in the contract, payment for furnishing and hauling such backfill material will be paid as extra work in accordance with Article 104-7. Placing and compacting such backfill material is not extra work but is incidental to the work being performed.

Payment will be made under:

Pay Item	Pay Unit
Culvert Excavation, Sta. ____	Lump Sum
Foundation Conditioning Material, Box Culvert	Ton

## SECTION 416 CHANNEL EXCAVATION

### 416-1 DESCRIPTION

Excavate any material outside of the pay limits of foundation excavation, unclassified structure excavation or box culvert excavation, which is classified as channel excavation in the plans. Place suitable excavated material as directed, drain and divert water, pump, blast, haul, dispose of materials and backfill.

Do not deposit excavated materials, nor construct earth dikes or other temporary earth structures in rivers, streams or impoundment or so near to such waters that they are carried into any river, stream or impoundment by stream flow or surface runoff.

### 416-2 CONSTRUCTION METHODS

Notify the Engineer a sufficient time before beginning the excavation so measurements may be taken of the undisturbed ground. Do not disturb the existing ground without permission.

Remove and dispose of boulders, vegetative material and any other objectionable material.

Use and place suitable excavated material in accordance with Articles 410-7 and 410-8.

### 416-3 MEASUREMENT AND PAYMENT

Channel excavation will be measured and paid on a cubic yard basis. Materials will be measured in their original position within the limits described below and computed by the average end area method, that are acceptably excavated in accordance with the contract or as directed.